Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Connect America Fund	)	WC Docket No. 10-90
	)	
High-Cost Universal Service Support	)	WC Docket No. 05-337

REPLY COMMENTS OF THE UNITED STATES TELECOM ASSOCIATION, AT&T, CENTURYLINK, FAIRPOINT COMMUNICATIONS, FRONTIER COMMUNICATIONS, VERIZON, AND WINDSTREAM COMMUNICATIONS

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Pursuant to the Public Notice released by the Wireline Competition Bureau on June 8, 2012,[1] the United States Telecom Association, AT&T, CenturyLink, Fairpoint Communications, Frontier Communications Corp., Verizon, and Windstream Communications (collectively the ABC Coalition) respectfully submit these reply comments on the model design and data inputs for Phase II of the Connect America Fund.

I. INTRODUCTION AND SUMMARY

The ABC Coalition continues to recommend that the Bureau model a green-field fiber-to-the-DSLAM (FTTD) architecture, with terminal value measured as initial investment minus economic depreciation as estimated by the CQBAT model, and with common costs allocated according to the cost-causation principles utilized in the CQBAT model. None of the issues raised by other commenters call that recommendation into question.

The only party opposed to our arguments for modeling a FTTD architecture is the National Association of State Utility Consumer Advocates (NASUCA), which argues that the Bureau should model fiber-to-the-premises (FTTP) to "signal" a desire for broadband networks that could one day achieve downstream speeds as high as 100 Mbps, notwithstanding the Commission's decision to require downstream speeds of only 4 Mbps. But NASUCA appears to concede that a FTTP model would not accurately reflect providers' actual forward-looking costs, since—as the Bureau and all commenters agree—carriers accepting CAF Phase II support will most likely build FTTD networks, not FTTP. The Bureau's model-design decisions should not be driven by their perceived symbolic value, especially when this would produce an inappropriate model and generate misleading expectations or inefficient support amounts.

[1] *Wireline Competition Bureau Seeks Comment on Model Design and Data Inputs for Phase II of the Connect America Fund*, DA 12-911 (released June 8, 2012) ("Public Notice"), *reprinted at* 77 Fed. Reg. 38804 (June 29, 2012).

NASUCA is also wrong in assuming that, because the CAF Phase II budget is fixed at $1.8 billion, the Commission or the Bureau could impose higher speed requirements without adverse consequences. Because higher speed networks require greater incremental capital investment, supported carriers would build out to far fewer locations. That is at odds with the Commission's instruction that the model should first ensure 4 Mbps/1 Mbps broadband to the maximum number of locations before seeking to provide higher speeds.

Nearly all commenters agree with the ABC Coalition that the Bureau should model a green-field, rather than a brown-field, deployment. The sole exception is the American Cable Association (ACA), which contends that the Commission should prefer a brown-field approach to a green-field approach because a brown-field model estimates lower support amounts per location. But ACA's self-interested effort to minimize support payments to ILECs ignores the serious risk that, if modeled support amounts are too low, carriers will decline support and will not build out broadband in unserved areas. That would defeat the Commission's goal of extending broadband access to the maximum number of locations within the next five years. Moreover, ACA's dubious brown-field estimates and its recommendations on data inputs illustrate our concerns that an accurate brown-field model simply cannot be developed and implemented within reasonable cost or time constraints.

The Bureau should measure terminal value at the end of the five-year support period as initial investment minus economic depreciation, as estimated by the CQBAT model. Some commenters recommend using zero terminal value, but that is too low because it ignores the value of network assets retained by the carrier at the end of five years. Other commenters recommend using predicted commercial or economic value as terminal value, but that is too uncertain because it depends on speculative forecasts about future revenues and profit, which are

subject to unknown technological and economic developments. The best approach is the one employed by the CQBAT model, which uses the initial price of network assets as a starting point, then estimates depreciation according to an empirically derived curve reflecting their remaining economic lifetime at the end of the support period. The ABC Coalition strongly opposes the Joint Michigan Competitors' proposal to abolish the five-year support commitment, which would render CAF Phase II support too uncertain to justify incurring the enormous upfront investment cost of building out a broadband network, and would welcome a decision by the Commission to extend the support period beyond five years, as recommended by NASUCA.

The ABC Coalition continues to recommend that the costs associated with shared plant be allocated according to the cost-causation methodology employed by the CQBAT model. Most commenters agree with the ABC Coalition that common cost of shared plant must be fully allocated between eligible and ineligible areas. Only ACA purports to support a subtractive approach, which would fund only the incremental costs of building out to eligible areas, but it does so on the presumption that the ineligible areas are "economically viable" on their own—an assumption that, as our initial comments explained, is unsound—and it acknowledges that the subtractive approach may be too computationally complex to model. In the alternative, ACA recommends allocating the costs of shared plant according to the bandwidth used by each end-user, but that approach fails to follow cost-causation principles. NASUCA proposes to allocate common costs using Shapley values, which have certain desirable qualities, but that would be even more computationally complex than the already-infeasible subtractive approach. Instead, the Bureau should adopt the cost-causation methodology employed by the CQBAT model, which adheres to traditional cost-causation principles.

In our initial comments, the ABC Coalition proposed that the Bureau develop an updated dataset of national broadband coverage by starting with the national broadband data collected in December 2011 and implementing a challenge process to allow private broadband providers to contribute updates to these data. ACA agrees with us that the baseline should be the State Broadband Initiative data collected for the National Broadband Map, and other commenters echo our recommendation that the Commission adopt a challenge process. That challenge process would also accommodate any fixed-wireless and satellite providers that can demonstrate that their services meet the Commission's standards for speed, coverage, data allowance, latency, and price.

Several providers serving insular territories argue that the CQBAT model does not fully account for all of their costs. We recognize that the CQBAT model may require certain changes to model logic or input values to address these concerns. But the ABC Coalition believes that, if insular territories receive support from the same $1.8 billion fund as mainland providers, support for these areas should be estimated using the same model that applies to other carriers. If, however, the Commission were to create a separate CAF fund for insular territories, the ABC Coalition would not object to developing a separate model for allocating support from that fund.

The $80 lower-cost threshold proposed in the initial ABC Plan represents a reasonable and conservative benchmark that would not result in overly generous model support. This benchmark represents the 95th percentile of the estimated cost distribution from the CQBAT model, which is also the point at which the cost curve begins to increase exponentially. This benchmark also maximizes the number of supported locations subject to the requirements that no more than one percent of locations be served by the Remote Areas Fund and that total CAF

Phase II support not exceed $1.8 billion. Available data indicate that the $80 threshold is extremely conservative and will not overcompensate carriers.

The Bureau should reject the proposal of the Joint Michigan Competitors to deny CAF Phase II support to price cap carriers in areas where they have already built out broadband networks even when forward-looking costs exceed the lower cost benchmark. That position is inconsistent with the theory of forward-looking cost and ignores the fact that existing networks were built in reliance on significant implicit and explicit subsidies that are being phased out.

As determined by the Commission, the census block is an appropriate geographic unit for estimating cost and support. NASUCA's proposal to calculate support based on the distribution area supported by a remote terminal appears reasonable in theory; but accurate, disaggregated data are not typically available at that level, and costs per location may vary even within the area served by a remote terminal. NASUCA is correct, however, that there may be certain locations within a given census block for which the estimated cost exceeds the threshold for the Remote Area Fund, so price cap carriers that accept CAF Phase II support should be able to employ alternative technology to reach the most expensive locations in eligible census blocks provided that they build out to at least that many locations in census blocks whose costs exceed the benchmark for the Remote Areas Fund.

Finally, while the Commission's primary goal should be to ensure that reform is done right, the ABC Coalition also wishes to reiterate the importance of implementing the model in time to begin distributing CAF Phase II support as close as possible to the January 1, 2013 deadline. While the Commission has provided for an extension of CAF Phase I incremental support if CAF Phase II is delayed, that interim support would be far smaller than the amount budgeted for CAF Phase II and is not enough for carriers to continue building out to new, ever-

more-expensive locations. Any delay in implementing CAF Phase II could therefore delay the availability of broadband access for millions of rural Americans and may even jeopardize the economic viability of current services. The Bureau should therefore make every effort to implement CAF Phase II without delay.

II. DISCUSSION

A. While The Bureau's Primary Goal Should Be To Ensure That Reform Is Done Right, It Must Make Every Effort To Adhere To The Commission's January 2013 Deadline To Implement CAF Phase II.

To be sure, it is of utmost importance that the Bureau design a model that accurately reflects the forward-looking costs of carriers deciding whether to accept support on a statewide basis. But the ABC Coalition wishes to reiterate the critical importance of selecting a model design that can be implemented in time to begin distributing CAF Phase II support by the Commission's January 1, 2013 deadline,[2] or as soon as possible thereafter. As we explained in our initial comments, under the Commission's current rules, the incremental support to carriers during any delay would be capped at $300 million annually, far short of the $1.8 billion in total annual support that has been budgeted to support broadband deployment by price cap carriers under CAF Phase II.[3] Any delay in implementing CAF Phase II could thus substantially delay the deployment of broadband service to rural areas.

We therefore disagree with the suggestion by the National Association of State Utility Consumer Advocates (NASUCA) that there would be little harm in "[w]aiting until July 2013 or January 2014" because the Commission could provide "an extension of the current frozen

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[2] *Connect America Fund*, WC Docket No. 10-90, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd. 17663, 17722, 17737, paras. 148, 192 (2011) (*USF/ICC Transformation Order*).

[3] ABC Coalition Comments at 5-6.

support" in the interim.[4] That is wrong for two reasons. First, even if support were to continue at current levels, carriers would not begin to build out new broadband networks into many rural areas until they know that they will receive CAF Phase II support and how much support they will receive. The resulting delay would deprive many millions of rural Americans of access to robust broadband networks for months or even years to come. Second, NASUCA is incorrect to presume that if CAF Phase II is delayed, carriers will continue to receive interim support at current levels. As our earlier comments explained, while the Commission has provided for a temporary extension of CAF Phase I incremental support, various universal service and intercarrier compensation reforms will soon begin to phase out or eliminate other subsidies that carriers currently rely on provide ongoing service to rural areas.[5]

Moreover, absent a waiver of certain conditions for receiving CAF Phase I incremental support, price cap carriers must build out to an additional location for every $775 they receive.[6] As some coalition members have previously explained, that per-location subsidy is too low—far less than the actual cost.[7] And because carriers will fulfill this commitment by building out to the lowest-cost locations first, the marginal cost of building out to another new location will grow over time, while the per-location subsidy remains fixed. Because it will not be economical to continue building out to new, increasingly costly locations for this fixed subsidy rate, an extension of CAF Phase I incremental support may go unused.

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4 NASUCA Comments at 19.

5 ABC Coalition Comments at 6, 18-19.

6 *USF/ICC Transformation Order*, 26 FCC Rcd. at 17673, 17737, paras. 22, 192.

7 *See, e.g.*, Frontier Commc'ns Corp. & Windstream Commc'ns, Inc. Petition for Reconsideration and/or Clarification, WC Docket No. 10-90, at 12-20 (filed Dec. 29, 2011).

Failure to implement CAF Phase II on time thus would delay the availability of broadband access in rural areas and could potentially even jeopardize the economic viability of current services. The Bureau must therefore make every effort to implement CAF Phase II within the timeframe established by the Commission.

B. The Bureau Should Model A Fiber-To-The-DSLAM Architecture

In our initial comments, the ABC Coalition argued that the Bureau should model a fiber-to-the-DSLAM (FTTD) architecture for three reasons, none of which are challenged or contradicted by any other commenters. First, consistent with the standard set forth in the *Universal Service First Report and Order*, FTTD is "the least-cost, most-efficient, and reasonable technology for providing the supported services ***that is currently being deployed***" in rural areas similar to the areas that are likely to be eligible for CAF Phase II support.[8] Second, due to the economics of rural broadband, carriers that accept CAF Phase II support will generally build or maintain FTTD networks, rather than deploy a new and more capital-intensive technology like FTTP—especially when support is only guaranteed for five years. Modeling that same architecture will ensure that the modeled costs most closely align with the actual forward-looking costs of carriers when they decide whether to accept or decline support.[9] Third, a FTTD model would allow the Bureau to reasonably estimate the number of locations that will be able to scale up to 6 Mbps/1.5 Mbps speeds, whereas a FTTP model is unable to make these estimates.[10]

The American Cable Association (ACA), whose members frequently confront similar decisions as to whether there is a business case for expanding their networks and what network

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[8] ABC Coalition Comments at 7-9 (quoting *Universal Service First Report and Order*, 12 FCC Rcd. at 8913, para. 250(1) (emphasis added)).

[9] *Id.* at 9-11.

[10] *Id.* at 11-12.

technology to use, echoes our predictions. As it correctly notes, "[p]rice cap LECs are unlikely to build out fiber-to-the-home because they can meet the Commission's mandate . . . with a much less expensive network build"—namely, FTTD DSL.[11] The Bureau should therefore model a FTTD architecture, because otherwise "[f]unding will not be efficiently allocated if there is a mismatch between the network technology and design used in the cost model and the price cap LECs' realistic deployments to meet the public interest obligations."[12] Instead, "the cost picture should reflect how these LECs actually build networks in the real world and how the develop business cases for planning build-outs."[13]

NASUCA argues that the Bureau should use a FTTP model because, it says, "if public support is to be used to fund broadband, the networks should be scalable."[14] But its argument is deeply flawed in multiple respects.

NASUCA's argument first fails because, as the Public Notice repeatedly pointed out, the decision to ***model*** a FTTP architecture would not obligate providers to ***deploy*** that same technology.[15] Even if the Bureau were to adopt a FTTP model, carriers instead will "most likely . . . deploy DSL."[16] NASUCA eventually acknowledges this, but insists that the Bureau should

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[11] ACA Comments at 10.

[12] *Id.*

[13] ACA Comments at 5. We note that, while ACA favors a FTTD deployment, it also recommends using a brown-field rather than green-field model. We explain below (at pp. 12-16) and in our initial comments (ABC Coalition Comments at 15-19, 22-23) why this analysis is wrong with respect to the decision between green-field and brown-field. But ACA is correct in arguing that the fact that price-cap carriers will likely deploy DSL broadband networks—using FTTD—counsels in favor of modeling a FTTD architecture.

[14] NASUCA Comments at 3 & 9.

[15] Public Notice at 5, para. 13 & n.1; *id.* at 7, para. 19.

[16] *Id.* at 12, para. 34 & n.39; *see also* ABC Coalition Comments at 9-11.

use a FTTP model anyway in order to "signal clearly to carriers" that the Commission "intends to meet" its "long term goal of 100 mbps service."[17] This simply confirms the ABC Coalition's concern that "a decision by the Bureau to use a FTTP model would lead some observers mistakenly to expect carriers to be able to provide higher speeds than those provided by the DSL networks that most carriers will actually deploy."[18] The Bureau's model-design decisions should not be driven by their perceived symbolic value, especially when this would produce a less accurate model and generate misleading expectations or inefficient support.

NASUCA's suggestion that the Bureau adopt a FTTP model so as to pressure price cap carriers to deploy this architecture is also at odds with the Commission's own directions. In the *USF/ICC Transformation Order*, the Commission purposely chose to favor the goal of maximizing broadband ***access*** over the goal of maximizing broadband ***speed***. For this reason, the Order directs that the model should first ensure 4 Mbps/1 Mbps service to the maximum number of locations, and then ***only after*** maximizing the number of locations with broadband access is the model to aspire to the subsidiary goal of providing 6 Mbps/1.5 Mbps access to as many of those locations as possible.[19]

These priorities make sense. The difference between 4 Mbps/1 Mbps service and 6 Mbps/1.5 Mbps service (or better) is negligible compared to the difference between 4 Mbps/ 1 Mbps and no broadband at all. Indeed, at present it is possible that 4 Mbps/1 Mbps speeds may

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[17] NASUCA Comments at 9-10.

[18] ABC Coalition Comments at 12 n.26.

[19] *USF/ICC Transformation Order*, 26 FCC Rcd. at 17735, para. 187 ("[T]he model should direct funds to support 4 Mbps/1 Mbps broadband service ***to all supported locations*** . . . and should ensure that ***the most locations possible*** receive a 6 Mbps/1.5 Mbps or faster service at the end of the five year term, consistent with the CAF Phase II budget" (emphasis added)); *accord* Public Notice at 2, n. 11.

suffice for rural areas for years to come; there is no reason to incur the cost of higher-speed networks when they might not be needed. And if faster speeds do become necessary, the network can be upgraded at that time. As ACA points out, the OBI staff has calculated that the lowest-cost upgrade path would be to build DSL first and later upgrade to fiber when network demand calls for it.[20]

Moreover, NASUCA is wrong that the Commission or the Bureau could impose higher speed requirements without adverse consequences. Higher-speed networks would require significantly more incremental capital investment than the 4 Mbps/1 Mbps speed requirement set by the Commission.[21] While NASUCA is correct that "the *total* amount of support" is fixed at $1.8 billion,[22] a network architecture requiring greater incremental capital investment likely will result in fewer locations served by that fixed budget. Such an outcome would contravene the Commission's decision to prioritize broadband access over broadband speed. For this reason, the Commission's directions counsel in favor of DSL, which will maximize the number of new locations that receive 4 Mbps/1 Mbps broadband service given the CAF Phase II budget, rather than a technology such as FTTP that requires significantly greater incremental capital investment.

Finally, as we explained in our initial comments, a FTTD model would allow the Bureau to reasonably estimate the percentage of the total locations served that can be expected to receive 6 Mbps/1.5 Mbps broadband.[23] A FTTP model, by contrast, would predict that ***every*** location

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[20] ACA Comments at 13 n.27; *accord* ABC Coalition Comments at 9-10 & n.18.

[21] *OBI Technical Paper No. 1*, at 41 & Exh. 3-I

[22] NASUCA Comments at 2.

[23] ABC Coalition Comments at 11-12.

can receive those higher speeds, even though that will not be true for the FTTD networks that most carriers will choose to deploy. Regrettably, selecting a model with unrealistically high speed expectations will not magically allow carriers to build higher speed networks at no extra cost.

C. The Bureau Should Model A Green-field Deployment

Our initial comments presented four reasons why the Bureau should model a green-field, rather than a brown-field, deployment. First, the Commission has consistently adopted a green-field model in its prior proceedings, since, as the Commission explained in the *Universal Service First Report and Order*, "the proper measure of cost for determining the level of universal service support is the forward-looking economic cost of constructing and operating the network facilities and functions used to provide the supported services."[24] And this green-field approach has twice been sustained on appeal.[25]

Second, both the Commission and state PUCs have successfully employed green-field models in many past proceedings.[26] As NASUCA points out, "[m]any stakeholders are familiar with these types of models" and can provide insight from past experience.[27]

Third, the brown-field approach is conceptually flawed, because it fails to consider costs associated with existing infrastructure—operating cost (including replacement capital expense

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[24] *Universal Service First Report and Order*, 12 FCC Rcd. at 17746, para. 224; *see also* ABC Coalition Comments at 13-15 (discussing the *Universal Service First Report and Order* and the *Local Competition Proceeding*).

[25] *Verizon Commc'ns Inc. v. FCC*, 535 U.S. 467, 475, 497-528 (2002) (upholding the Commission's authority to set rates "on a forward-looking basis untied to the incumbents' investment"); *Qwest Corp. v. FCC*, 258 F.3d 1191, 1194, 1205-07 (10th Cir. 2001) ("We review and uphold the FCC's computer model of the costs of providing service in a given area.").

[26] ABC Coalition Comments at 13-15, 22.

[27] NASUCA Comments at 5.

and maintenance expense), depreciation expense, and a return on capital in existing plant. As we explained in our initial comments, "by focusing only on required incremental investment . . . the brown-field approach inevitably underestimates the total forward-looking cost of constructing and operating a network. . . . But these excluded costs are real costs, which regulators and courts have long recognized that carriers should be able to recover."[28] Nor can one ignore these costs on the assumption that existing infrastructure is breaking even, since the existing infrastructure relies on explicit and implicit subsidies that are being phased out.[29]

Finally, a brown-field model faces insurmountable practical problems because it requires detailed input data that are not currently available and could not feasibly be collected within reasonable cost or time constraints.[30] As the Puerto Rico Telephone Company (PRT) describes it, the brown-field approach "opens up a host of issues" because it cannot accurately be estimated without these data, including detailed data on "[v]ariations in age, quality, and size of existing plant[], and differences in the condition of existing copper deployments."[31] NASUCA likewise points out that estimating a brown-field model would require "data pertaining to depreciation reserves, average remaining lives, size and fill of cables, and capacity of circuit equipment."[32] As NASUCA puts it, "[c]ollecting and incorporating that data into a model is an enormous and overwhelming task."[33] And even if the data were available, it would not be possible to isolate

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[28] ABC Coalition Comments at 15-17; *see also id.* at, 22-23.

[29] *Id.* at 17-19.

[30] *Id.* at 19-21.

[31] Puerto Rico Telephone Co. Comments at 10.

[32] NASUCA Comments at 7-8.

[33] *Id.* at 8.

the portion of the existing infrastructure that is unsubsidized from the portion that was built in reliance on implicit or explicit subsidies.

Most commenters that address this issue agree that a green-field model is superior.[34] The sole commenter that favors a brown-field model is ACA, but its arguments bear little purchase. The principal reason ACA gives for its position is that, according to its selected model runs, a brown-field model would yield lower support amounts per location.[35] Indeed, at every possible turn, ACA lobbies for the model-design option that would result in the lowest estimated cost and the lowest possible level of support.[36] ACA correctly observes the risk that, if modeled support costs were too high, this would limit the number of locations that could be covered within the program's fixed budget.[37]

But ACA simply ignores the danger that modeled support amounts might be ***too low***. If so, ILECs will decline support and will not build out broadband in unserved areas. That would be good for the cable companies ACA represents, which presumably want to minimize funds going to their competitors—even though areas that continue to go without broadband are unlikely to become potential markets for cable broadband in the future, given past decisions not

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[34] *See, e.g.*, ACS Comments at 9-10; NASUCA Comments at 5-9; PRT Comments at 10-11.

[35] ACA Comments at 11-14.

[36] ACA argues for modeling a DSL network, which yields lower support amounts than FTTP (*id.* at 10); for a brown-field approach, which yields lower support amounts than a green-field approach (*id.* at 13); for using predicted commercial value as terminal value, which yields lower support amounts than using book value or zero value (*id.* at 14-15); and for a subtractive approach to shared costs, which yields lower support amounts than a distributed approach (*id.* at 17).

[37] *Id.* at 2. *But see* NASUCA Comments at 6 (explaining that higher estimated costs may shift the upper and lower support thresholds so as to transfer support from less-dense census blocks to more-dense census blocks, and could thereby result in more total locations receiving broadband).

to deploy to these areas. But it would be a failure for the Commission, whose stated goal is to extend broadband access to the maximum number of locations within the coming five years.

In any event, ACA's comments simply reinforce the problems with a brown-field model. ACA relies on estimates from the CQBAT model reporting a dubious four-fold difference in cost between a brown-field approach and a green-field approach.[38] Just two pages before, however, ACA admits that "there is some uncertainty in the costs for brownfield DSL in the . . . CQBAT model."[39] And it attributes this "uncertainty" to "concerns" that actual size and quality of copper gauge, for which there are little data, might not be capable of supporting the broadband service that ACA models.[40]

ACA's recommendations on data inputs illustrate just how implausible it would be to collect all of the data necessary to accurately estimate a brown-field model. ACA would require all carriers "to document their plant mix" and "to document the age of their plant."[41] It then further "proposes that carriers be required to document the geographic location of inferior gauge copper plant."[42] As our previous comments detailed, these data are not readily available, would be prohibitively costly and time-consuming to collect, and would be difficult to present in usable electronic form.[43] For example, NASUCA points to a proceeding before the Maine Public Utilities Commission where companies did possess the requested address data, but problems

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[38] ACA Comments at 13 & n.26.

[39] *Id.* at 11.

[40] *Id.* at 11 n.21.

[41] *Id.* at 25.

[42] *Id.*

[43] ABC Coalition Comments at 20-21.

arose because "companies used different internal data bases . . . and, in many instances, it was not possible to locate a remote using street maps or geo-coding techniques."[44] Given these difficulties, moreover, the data are likely to include a number of errors and inaccuracies, especially since much of these data would not be verifiable by the public or others. These data-collection issues alone would render it impracticable to use a brown-field approach to model CAF Phase II deployment costs.

D. Support Should Be Guaranteed For At Least Five Years, With Terminal Value Measured As Initial Investment Minus Economic Depreciation, As Estimated By The CQBAT Model

1. The Commission Should Guarantee Five Years Or More Of Support

In its initial presentation of the ABC Plan, the ABC Coalition proposed that broadband support be guaranteed for a period of ten years.[45] In the *USF/ICC Transformation Order*, the Commission lowered the guaranteed support period to only five years.[46] Apparently still unsatisfied, the self-styled "Joint Michigan Competitors" urge the Commission to abandon ***any*** guaranteed support commitment and terminate support as soon as any competitor enters the market.[47]

The Bureau should reject this radical proposal. Without a guaranteed support period, few if any carriers would be willing to incur the enormous upfront investment cost of building out a broadband network, especially in rural locations where there is no business case to do so. A

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[44] NASUCA Comments at 7.

[45] Letter from Robert W. Quinn, Jr. *et al.* to Marlene H. Dortch, WC Dkt. No. 10-90, Attach. 1 at 2 (filed July 29, 2011) ("ABC Plan").

[46] *USF/ICC Transformation Order*, 26 FCC Rcd. at 17673-74, 17729-30, paras. 23-24, 172.

[47] Joint Michigan Competitors Comments at 5-9.

promise of support that could be undercut at any time by entry of a competitor is no meaningful promise at all.

Indeed, the Joint Michigan Competitors urge the Commission to go even further and refuse support to areas where unsubsidized competitors say they merely ***plan*** to eventually serve, "even if such projects won't be completed for one or two years."[48] But consumers should not be deprived of support for broadband build-out now because a single competitor has expressed some aspiration to bring broadband to that area one day in the future—especially when there is no way to know if it will actually be able to fulfill that aspiration.

On the other end of the spectrum, NASUCA argues that the Commission should explicitly commit to continuing support beyond a five-year window.[49] The ABC Coalition agrees that it would be preferable for the Commission to make a longer commitment than five years. If given a promise of support over a longer period, carriers may be more willing to incur the substantial upfront investment to build out broadband networks, and those who would already accept funds may be more willing to invest in new, more capital-intensive technologies that provide consumers with faster speeds and more reliable service.

NASUCA suggests that the "first-mover advantage" means that, for practical purposes, LECs can count on receiving support for a longer period than five years.[50] The ABC Coalition members are not so confident, however. As we cautioned in our initial comments, new technological and economic developments could allow support to shift to a competitor at the end

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[48] *Id.* at 6.

[49] NASUCA Comments at 4, 13 (recommending that the Commission "indicate unambiguously that it intends to continue broadband high-cost support as long as it is needed").

[50] *Id.* at 13 & n.17.

of five years.[51] Indeed, the Joint Michigan Competitors predict in their comment that fixed wireless and other technologies will allow them to enter and compete in these markets in the near future.[52] Carriers are therefore unlikely to incur additional investment based on the prospect of future support unless that support is backed by a formal guarantee.

2. Terminal Value Should Be Measured As Initial Investment Minus Economic Depreciation, As Estimated By The CQBAT Model

The ABC Coalition continues to believe that terminal value should be measured as initial forward-looking investment cost minus economic depreciation, as estimated by the CQBAT model.[53] This approach improves upon the straight-line depreciation in the book-value approach and provides a middle ground that is more reasonable than either the highly speculative commercial-value approach or the overly pessimistic zero-value approach.

a. The Commercial-Value Approach Should Be Rejected

In our initial comments, we explained that an economic- or commercial-value approach is correct in theory but unworkable in practice.[54] The commercial value of the network at the end of the five-year period depends on many factors that are too uncertain to predict with any meaningful accuracy, including future technological developments, shifts in consumer demand, and regulatory changes. Alaska Communications Systems Group (ACS) agrees in its comments that "it would not be possible to accurately forecast commercial or economic value for each study area."[55]

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[51] ABC Coalition Comments at 27.

[52] Joint Michigan Competitors Comments at 5.

[53] *See* ABC Coalition Comments at 24-29.

[54] *Id.* at 26-28.

[55] ACS Comments at 10.

Of the other commenters, only ACA recommends that the Bureau predict commercial value for use as economic value.[56] It argues that one can "develop[] a reasonably realistic picture of the actual commercial value of the network" because the CQBAT model can estimate "both economic useful lives and salvage rates."[57] That may be sufficient to estimate book value and physical and technological depreciation, but it is not enough to estimate commercial value. Instead, as the Bureau recognized in the Public Notice, a commercial-value approach requires that the model be able "to forecast ***revenue and profit***."[58] These in turn require foreknowledge of future consumer demand, which depends in turn on a variety of technological and economic developments. Because these factors simply cannot be forecast with any meaningful accuracy—and ACA does not offer any reason to think otherwise—commercial value is simply too uncertain to serve as the terminal value in a forward-looking cost model.

b. The Zero-Value Approach Also Should Be Rejected

Alaska Communications Systems Group (ACS) and PRT each argue that the model should assign zero terminal value. ACS argues that a zero terminal value is "the only away that carriers will be able to recover their costs under a program where support will not be assured beyond the five-year mark."[59] PRT likewise argues that the model must "[s]et[] terminal value at zero . . . since there is no guarantee of support beyond the five-year mark," and that after five years "carriers [may] not have sufficient subscriber revenue to sustain the network."[60]

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[56] ACA Comments at 15.

[57] *Id.*

[58] Public Notice at 10, para. 27 (emphasis added).

[59] ACS Comments at 11.

[60] PRT Comments at 12.

We agree that the Bureau's decision to guarantee support for only five years creates a risk that the network may no longer be economically viable after that period, and this risk reduces the expected terminal value of the network.[61] But the ABC Coalition does not believe that this risk is so great that terminal value must be set to zero, because it is possible that a price cap carrier at the end of five years will win the reverse auction. In that case, support will continue beyond the five-year period, and thus that the assets will remain in use.[62] While ACS is correct that the network is not guaranteed to continue operating beyond five years, the likelihood of it shutting down entirely is not so high that the terminal value should reduced all the way to zero.

While ACS and PRT focus on the risk of ***overstating*** the terminal value, both neglect the danger of ***understating*** terminal value. Using a zero terminal value in the calculation will inflate the estimated costs, and thus the support amount required in each location. The result will be that fewer locations can be supported within the fixed budget. The Bureau should not adopt an approach that would completely neglect the continuing value of the network at the end of the five-year support period.

c. Initial Investment Minus Economic Depreciation, As Estimated By The CQBAT Model, Provides The Best Measure Of Terminal Value

As we previously argued, the best approach is to measure terminal value as initial investment minus economic depreciation, as estimated by the CQBAT model.[63] That approach uses the market-determined price of network assets as the starting point, then estimates depreciation according to an empirically derived curve reflecting their remaining economic

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[61] *Cf. id.* at 12 ("Consideration of that risk may result in carriers declining support and short circuiting the entire purpose of USF reform.").

[62] *See* pp. 17-18, *supra*.

[63] ABC Coalition Comments at 28-29.

lifetime. This resembles the "book value" approach identified in the Public Notice, but more accurately models the remaining value of network assets than if one were to use simple straight-line depreciation.

The CQBAT approach recognizes that carriers will retain some valuable economic assets at the end of five years and that this should be factored into the model. At the same time, it does not depend on speculative forecasts of future commercial value, which would yield unreliable, and likely highly inaccurate, model estimates. As such, the CQBAT approach offers a compromise that best aligns modeled costs with the actual forward-looking costs of an efficient provider.

E. The Cost of Shared Plant Should Be Allocated According To The Cost-Causation Methodology Employed By The CQBAT Model

1. Most Parties Agree That The Cost Of Shared Plant Must Be Allocated

The ABC Coalition explained in our initial comments that the so-called "subtractive approach," which would provide only enough support to cover incremental cost of the shared plant and would not cover any portion of common cost, is fundamentally unsound and unfair and should not be followed.[64] Other parties appear to agree that the subtractive approach would under-allocate costs and thus result in insufficient support to justify broadband build-out in eligible areas. The Nebraska Rural Independent Companies, for example, echo our concern that "[i]f the shared costs are under-allocated to the eligible areas, support will not be sufficient to induce carriers to provide service in those census blocks."[65] ACS likewise urges that "there must

[64] ABC Coalition Comments at 32-33.

[65] Nebraska Rural Independent Companies Comments at 15.

. . . be a reasonable way to determine what portion of a carrier's shared network costs should be supported."[66]

While ACA purports to support the subtractive approach, a closer reading of its argument actually supports our position that the cost of shared plant generally should be allocated among all locations in both eligible and ineligible areas. ACA states that "the costs to support eligible locations should be based on the incremental cost of serving that location ***above the rest of the economically viable network build-out***."[67] In other words, ACA's argument for providing only incremental costs in eligible areas is based on the presumption that the ineligible areas are "economically viable" on their own—that is, it depends on the assumption that the ineligible areas generate sufficient revenues to cover their stand-alone costs. But as our earlier comments explained, there is no basis for that assumption, and it may rarely (if ever) be satisfied.[68] Without that assumption, the forward-looking cost model will not provide sufficient support unless shared costs are allocated across both eligible and ineligible areas.

In our initial comments, we also agreed with the suggestion in the Public Notice that the subtractive approach "may be a computationally difficult method of allocating costs."[69] ACA appears to acknowledge that the subtractive approach is impractical (and perhaps even

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[66] ACS Comments at 10. While ACS agrees with the proposal to use a subtractive method insofar as it would exclude shared costs "that are only related to already served areas"—*i.e.*, costs shared between one unsupported area and another—it correctly argues that the Bureau should ***not*** subtract "costs that are shared between the already served and the unserved areas." *Id.* at 13. We agree with ACS that the forward-looking cost model must allocate such common costs between the eligible and ineligible areas, rather than providing the eligible areas only enough support to cover the incremental portion of the shared plant.

[67] ACA Comments at 17 (emphasis added).

[68] ABC Coalition Comments at 32-33.

[69] Public Notice at 19, para. 54; *see* ABC Coalition Comments at 33-34.

impossible) to model. ACA says that it "understands the Bureau's concern about determining 'a computationally tractable method'" to calculate the subtractive approach, and it acknowledges that "[t]he complexity of this task cannot be underestimated."[70] It then concedes that, "[b]ecause of the computational issues that arise with the subtractive methodology, the Commission may have no choice but to use the pro rata or formula method."[71] We agree—and the formula the model uses should follow the cost-causation methodologies developed in the CQBAT model.

2. Shared Costs Should Be Allocated According To The Cost-Causation Methodologies Developed In The CQBAT Model

The CQBAT model follows traditional cost-causation principles. As we explained in our initial comments, it has long been recognized that telephone networks exhibit significant economies of scope.[72] This means, as the Commission previously recognized, that setting prices or support levels on the basis of incremental cost alone will result in recovery of less than the total cost of the network.[73] Because of this, the Commission has adopted various methods for allocating common costs based on cost causation.[74] The CQBAT model, following the approach adopted in the HCPM and in the TELRIC pricing methodology, attempts to allocate the cost of shared plant based on cost causation principles.

Apparently recognizing the unfairness of the subtractive approach, NASUCA proposes to use Shapley values to allocate common costs.[75] Because the Shapley value has certain desirable

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[70] ACA Comments at 17 (quoting Public Notice at 20, para. 57).

[71] *Id.* at 18.

[72] ABC Coalition Comments at 30-31.

[73] *Id.* at 30-31

[74] *See id.* at 31 n.74.

[75] NASUCA Comments at 17-18.

properties,[76] and because it represents the average marginal cost of all the participants in a coalition (assuming that all permutations of the coalition are considered),[77] it frequently has been proposed as a method for allocating costs.[78] Unfortunately, it can be extremely complex computationally to derive Shapley values as the number of elements to be considered grows large,[79] and we are aware of no telecommunications regulator that has used this approach to allocate common costs. We believe that the Shapley allocation would be more complex than the subtractive approach, because the Bureau would have to calculate the stand-alone costs of the eligible CBs as well as the standalone costs of the ineligible areas. And, as we have previously

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[76] *See, e.g.*, Martin Shubik, *Incentives, Decentralized Control, the Assignment of Joint Costs and Internal Pricing,* 8 MGMT. SCI. 325, 334-36 (1962).

[77] *See, e.g.*, Martin Shubik, *The Cooperative Form, The Value, and the Allocation of Joint Costs and Benefits*, *in* COST ALLOCATION: METHODS, PRINCIPLES, APPLICATIONS 86 (H. Peyton Young ed. 1985) ("The [Shapley] value is the natural extension of the type of thinking in economics that made the use of marginal analysis so fruitful. In essence the [Shapley] value is the combinatoric version of marginal analysis. Instead of evaluating at a single point the marginal contribution is evaluated over all combinations, where all permutations of the players are deemed to be equally likely."); *see also* H. Peyton Young, *Methods and Principles of Cost Allocation*, *in* YOUNG, *supra*, at 19 (Shapley value "may be interpreted as the *average* marginal contribution each player would make to the grand coalition if it were to form one player at a time"); Sergiu Hart, *Shapley Value*, http://www.ma.huji.ac.il/~hart/papers/val-palg2.pdf (2006) ("[T]he Shapley value of a player to a game turns out to be exactly his *expected marginal contribution to a random coalition.*").

[78] *See, e.g.,* S.C. Littlechild & G. Owen, *A Simple Expression for the Shapley Value in a Special Case,* 20 MGMT. SCI. 370 (1973) (proposing to use Shapley value to allocate costs of an airport runway); Louis J. Billera, David C. Heath & Joseph Raanan, *Internal Telephone Rates: A Novel Application of Non-Atomic Game Theory,* 26 OPERATIONS RES. 956 (1978) (proposing to use Shapley value to allocate cost of telephone service among university users); Dov Samet, Yair Tauman & Israel Zang, *An Application of the Aumann-Shapley Prices for Cost Allocation in Transportation Problems*, 9 MATHEMATICS OF OPERATIONS RES. 25 (1984) (proposing to use Aumann-Shapley values to allocate transport costs).

[79] *See, e.g.*, Shubik, *supra* note 77, at 86 ("[W]hen numbers are few but bigger than five or six the calculation of the [Shapley] value is laborious unless use can be made of special properties."); *see also* Nimrod Mediddo, *Computational Complexity of the Game Theory Approach to Cost Allocation for a Tree,* 3 MATHEMATICS OF OPERATIONS RES. 189 (1978); Littlechild & Owen, *supra* note 78, at 370.

explained, the subtractive approach is already too complex to implement within the timeframe contemplated by the Commission.[80] Thus, for reasons of simplicity and administrative feasibility,[81] we cannot support NASUCA's suggestion.

ACA suggests that, if the subtractive approach turns out to be too complex to implement, then the Commission should allocate the cost of shared plant on the basis of "the bandwidth throughput each end-user on average is assumed to buy."[82] While this approach is marginally better than the subtractive approach, because it takes into account the total forward-looking cost of the network, it is inferior to the approach taken by the CQBAT model, because it fails to follow cost-causation principles. For example, suppose that a fiber feeder extended one mile, at which point it is connected to five customer locations (Segment A), and then it is extended another mile to a final customer location (Segment B). Under ACA's proposal, as we understand it, the cost of both segments would be divided by six, even though only one customer is causing the cost of Segment B. In contrast, under the CQBAT model, the entire cost of Segment B would be assigned to the last, most-distant customer, while the cost of Segment A would be divided among all six customers, consistent with traditional cost-causation principles.

F. Broadband Footprint Data Collection

All commenters appear to agree with the ABC Coalition that broadband footprint data needs to be updated for use in the CAF Phase II model. Moreover, ACA agrees with us that the baseline should be the State Broadband Initiative data collected for the National Broadband

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[80] ABC Coalition Comments at 33-34.

[81] *Cf.* Public Notice at 4, para. 11.

[82] ACA Comments at 18.

Map.[83] And other commenters echo our recommendation that the Commission should adopt a challenge process to allow private broadband providers to contribute further updates to these data.[84]

As before, we propose that the Commission initially presume that cable broadband satisfies the minimum standards for a competing broadband service; however, because it is not clear that satellite or fixed wireless will be able to meet the Commission's standards for speed, coverage, data allowance, latency, and price, the Commission cannot presume that these providers comply with all service-quality requirements.[85] But in areas where these providers are able to demonstrate through the challenge process that they meet all requirements for a competing broadband service, those areas should be deemed ineligible for support.

G. Insular Territories That Draw Support From The Same $1.8 Billion Fund Should Be Governed By The Same Model As Other Areas

ACS, PRT, and the Virgin Islands Telephone Corporation (Vitelco) all question whether the CQBAT model accurately estimates the costs of deploying broadband in insular areas. For

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[83] *See id.* at 23-24.

[84] *See* Joint Michigan Competitors Comments at 2-4; *see also* ACA Comments at 24 ("Local providers should have the opportunity to submit their most recent data and have it incorporated into the final version of the model.").

[85] The Commission has previously expressed skepticism about the ability of mobile and satellite providers to meet all service-quality standards. *See USF/ICC Transformation Order and NPRM*, 26 FCC Rcd. at 17736-37, 18096–97, paras. 189-91 & 1240-44. While Viasat accuses the Bureau of failing to adequately consider satellite and wireless technologies (Viasat Comments at 2), the Bureau was justified in relying on the Commission's prior determination. If Viasat or others maintain that "satellite and wireless broadband technologies" are "the most efficient broadband technologies available in a given local market" (*id.*), they are welcome to demonstrate through the challenge process that they presently offer service in that market and that their service meets all the service-quality requirements, including latency, price and data allowances. If a provider is not yet serving a given market, mere speculation that it could provide service at the required level is not enough to exclude that market from CAF Phase II support, especially when wireline technology has an established record of meeting the promised speed and service requirements.

example, ACS argues that certain input values "are in need of adjustment to reflect the real costs of building and maintaining networks in Alaska."[86] Similarly, PRT and Vitelco claim that the CQBAT model fails to consider the higher backhaul costs for carrying traffic from a wirecenter to an Internet peering point.[87] And PRT argues that the CQBAT model fails to take into account the lower income levels and lower penetration rates in Puerto Rico compared with the continental United States.[88] To the extent that there exist real issues involving the model platform or particular input values, these should be raised and resolved in workshops.

The ABC Coalition does not believe, however, that support for these insular territories should be determined through a separate model. When the Commission delegated to the Bureau "the authority to select the specific engineering cost model and associated inputs, consistent with this Order,"[89] it spoke only to a single model; it did not authorize the Bureau to adopt multiple models. The ABC Coalition believes that as long as both price cap carriers in the continental United States and those in insular areas are receiving funding from the same $1.8 billion fund, all funding should be determined using a single forward-looking cost model (though we acknowledge that some changes in model logic or input values may be necessary to reflect differing conditions). Using a single model provides an accurate and objective means to estimate the relative forward-looking cost of building out broadband networks, as well as a fair way to allocate a limited amount of funding. In contrast, if multiple cost models are used, this creates an

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[86] ACS Comments at 3; *see also* PRT Comments at 8-9 (arguing that there are higher shipping costs to Puerto Rico); Vitelco Comments at 5 (CQBAT does not consider excise taxes imposed on equipment imported into the Virgin Islands).

[87] PRT Comments at 6-7; Vitelco Comments at 4.

[88] PRT Comments at 3-6.

[89] *USF/ICC Transformation Order*, 26 FCC Rcd. at 17735, para. 187.

incentive for carriers to inflate the estimated costs in the model they use so as to earn a larger piece of a limited pie.[90]

If, however, the Commission were to decide to create a separate CAF fund for insular territories, the ABC Coalition would not object to developing a new model for allocating support among insular carriers. But so long as price cap carriers from the continental United States and from insular areas compete for support from a single, limited fund, then fairness demands that a single model be used to allocate those funds.

H. The $80 Lower-Cost Threshold Is A Conservative And Reasonable Benchmark

ACA's comments suggest that the Bureau adopt a revenue-based benchmark in place of the proposed $80 lower-cost threshold.[91] We believe, however, that a revenue benchmark would be too uncertain and too unrealiable for use in the model. To begin with, there are likely to be significant geographic variations in revenue arising from variations in demographic and market conditions. As the OBI staff recognized, expected revenues from broadband are likely to be heavily influenced by such demographic factors as income, educational attainment, age, and ethnicity,[92] and by market conditions. Because these factors vary from region to region, it is difficult to pinpoint a single expected average revenue per user.

An even greater problem with a revenue benchmark is that revenues are likely to vary over time in ways that are difficult to predict. For example, while in the near term the number of

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[90] *Cf. Universal Service First Report and Order*, 12 FCC Rcd. at 8900, para. 226 ("[A] forward looking cost methodology creates the incentive for carriers to operate efficiently and does not give carriers any incentive to inflate their costs.").

[91] ACA Comments at 20-22.

[92] *See* JOHN B. HORRIGAN, BROADBAND ADOPTION AND USE 3 (OBI Working Paper Series No. 1, Feb. 2010); *see also OBI Technical Paper No. 1*, at 47.

broadband subscribers is likely to continue to increase (though at a diminishing rate),[93] the greater concern for incumbent LECs is that they will continue to lose telephone subscribers as some consumers shift to cable VOIP, others to over-the-top VOIP, and others "cut the cord" entirely and rely solely on wireless.[94] More generally, it is not clear how revenues will be affected by future technological, economic, and regulatory developments. For these reasons, a revenue benchmark is far too uncertain to play a central role in the forward-looking cost model.

Instead of a revenue benchmark, the ABC Coalition proposed an $80 lower-cost benchmark, which was chosen for several reasons. First, the $80 cost benchmark corresponds roughly to the 95th percentile of the cost distribution estimated by the CQBAT model. In addition, as we explained in a prior filing, the 95th percentile represents the point in the cost distribution at which costs begin to increase exponentially.[95] Moreover, this benchmark maximizes the number of supported locations subject to the two constraints set by the Commission—keeping the number of locations served by the RAF below one percent[96] and keeping the budget for CAF Phase II within $1.8 billion.[97]

The $80 lower threshold is extremely conservative and will not overcompensate carriers. Based on publicly available data from AT&T and industry knowledge, the average revenue per connected household for combined voice and broadband service is around $57 per month, well

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93 *OBI Technical Paper No. 1*, at 45-47.

94 *See, e.g.*, Industry Analysis and Technology Division, Wireline Competition Bureau, *Local Telephone Competition: Status as of June 30, 2011*, June 3, 2012, at 16 tbl.1

95 ABC Plan, Attach. 3 at 20.

96 *USF/ICC Transformation Order*, 26 FCC Rcd. at 17837-38, 18092, para. 533, 1223.

97 *Id.* at 17725-26, paras. 158-159.

below our proposed $80 threshold at a 90 percent take-rate.[98] The ABC Coalition thus believes that an $80 lower-cost threshold presents a fair baseline that is acceptable to coalition members will not produce overgenerous support amounts.

I. Support Should Be Provided In Areas Where ILECs Have Already Built Out Broadband Networks If The Forward-Looking Cost Exceeds The Lower-Cost Threshold

The Joint Michigan Competitors argue that price cap carriers should not receive CAF support in areas where they have already built out broadband networks, even if the forward-looking cost exceeds the lower cost benchmark.[99] This is inconsistent with the theory of forward-looking costs and ignores the fact that, until recently, price cap LECs were subject to significant implicit and explicit subsidies.

As we explained in our initial comments, the fact that a carrier has built out broadband in a particular area does not mean that it is necessarily breaking even.[100] Until recently, price cap LECs were subject to significant implicit and explicit subsidies, as the Bureau appears to recognize.[101] With the reforms adopted in *USF/ICC Transformation Order*, however, many of these explicit and implicit subsidies will be phased out, and it is possible—even likely—that many areas that may have been breaking even no longer will. To the extent that broadband in some of these areas exists only because of implicit and explicit support, the Commission should continue to provide that support through CAF Phase II funds.

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98 *See* Appendix A.

99 Joint Michigan Competitors Comments at 9-11.

100 ABC Coalition Comments at 17-19.

101 Public Notice at 21, para. 61.

In addition, as the Bureau recognized, excluding built-out areas from receiving CAF Phase II support is inconsistent with the theory underlying green-field forward-looking cost models.[102] In choosing to base support on forward-looking costs, the Commission explained in the *Universal Service First Report and Order* that "the proper measure of cost for determining the level of universal service support is the forward-looking economic cost of constructing and operating the network facilities and functions used to provide the supported services as defined per section 254(c)(1)."[103] Under this forward-looking cost approach, which the Commission adopted knowing that many carriers would be able to provide the supported services in large part over existing networks, the fact that a carrier has already built out existing broadband infrastructure should not deprive it of the support necessary to maintain broadband service at the required level.

J. The Census Block Is An Appropriate Geographic Unit For Estimating Cost And Support

In the *USF/ICC Transformation Order*, the Commission determined that it would "use a forward-looking cost model to determine, on a census block or smaller basis, areas that will be eligible for CAF Phase II support."[104] NASUCA argues in its comments that the Commission should not use census blocks as the area for determining support, because there are a "substantial number of census blocks that have multiple costs," and it instead suggests that the Commission should calculate support based on "the distribution area served by a remote."[105]

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[102] *Id.*

[103] *Universal Service First Report and Order*, 12 FCC Rcd. at 17746, para. 224.

[104] *USF/ICC Transformation Order*, 26 FCC Rcd. at 17728, para. 167

[105] NASUCA Comments at 18-19.

Although NASUCA's proposal may sound reasonable in theory, we do not believe that it is practical for a number of reasons. First, most remote terminals serve an area larger than a census block, so choosing the distribution area of a remote terminal over a census block will on average result in greater averaging, not less. Second, in those rare cases where the distribution area is smaller than the census block, much of the data that is likely to be used in the model may not be reliable below the level of a census block. For example, many states collect broadband data for purposes of the State Broadband Initiative only at the census block level. Similarly, if the Commission were to use commercial databases to determine business and consumer locations, those data may not be sufficiently reliable below the census block level to justify estimating costs below the census block level. Finally, it is not clear whether NASUCA is referring to actual remote terminals and their areas, which would demand input data that are unlikely to be available, or modeled areas; either way, estimating an accurate model at this level would not be feasible. Thus, while the costs estimates for specific census blocks are likely to be reasonably accurate on average, the accuracy of the costs estimates for areas below the census block level become highly dependent on the quality and granularity of the data used by the model.

While NASUCA's proposal is unpersuasive, it is correct that there may be locations within a census block for which the estimated cost exceeds the threshold for the Remote Areas Fund. In those cases, it may make more sense to serve the location by means of an alternative technology. Thus, as we proposed in the ABC Plan, price cap carriers that accept CAF Phase II support should be able to employ alternative technology to reach the most expensive locations in

eligible census blocks provided that they build out to at least that many locations in census blocks whose costs exceed the benchmark for the Remote Areas Fund.[106]

III. CONCLUSION

For the foregoing reasons, the Bureau should model a green-field fiber-to-the DSLAM (FTTD) architecture, with terminal value measured as initial investment minus economic depreciation as estimated by the CQBAT model, and with common costs allocated according to the cost-causation principles utilized in the CQBAT model. The Bureau should use a conservative $80 lower-cost threshold and should develop an updated map of national broadband coverage. The model should be estimated at the census block level and should provide support not only to unserved areas but also to areas in which ILECs have already built out broadband networks if the forward-looking cost exceeds the $80 threshold. Insular territories that draw support from the same $1.8 billion fund should be subject to the same cost model used for mainland carriers.

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[106] ABC Plan, Attach. 1 at 7. We note that the Commission appeared to accept the logic of this proposal in the *USF/ICC Transformation Order*. *See* 12 FCC Rcd. at 17729, para. 171 n.279.

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Appendix A

Appendix A
Estimate of Average Revenue Per User (ARPU)
Based on Publicly Available AT&T Data

An estimate of Average Revenue Per User (ARPU) can be developed using public data from the AT&T End-of-Year Quarterly financials and industry knowledge. From the AT&T report, we take the following data:

Total wireline households in service	23,207,000
Total number of wireline consumer voice connections	21,232,000
Total number of wireline consumer broadband connections	12,492,000
Total number of consumer video connections	5,542,000

Based on industry knowledge, we assume an average revenue per month for voice service of $35 and an average revenue per month for broadband service of $40 per month.[1]

Using the assumed average revenues per month for voice ($35) and data ($40) and the End-of-Year AT&T data for total consumer voice and consumer broadband connections, we derive estimated voice and data total revenues:

Total revenues from wireline consumer voice connections	$743,120,000
Total revenues from wireline broadband connections	$579,680,000

We then divide these total revenue estimates by AT&T's total 23,207,000 consumer households in service ("connected households") to obtain separate average revenues per connected household (ARPCH) of $32.02 for voice and $24.98 for broadband.[2] Adding these together yields a total ARPCH of $57.00.

This ARPCH of course is based on AT&T customers rather than all consumers. The CQBAT model, however, uses all consumer locations, not just AT&T customers. Because AT&T's actual penetration (compared to all consumer locations) is significantly below the 90 percent assumed by the model, the $57 represents an overestimate of likely average revenue.

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[1] These assumptions are close to those adopted in the OBI modeling effort. OBI assumed an average revenue per month of $33.46 for voice service and a median revenue per month of $40 for broadband service (the range was from $36 per month to $44 per month). *See OBI Technical Paper No. 1* at 50, Exh. 3-V.

[2] We do not consider revenues from video services, because video cannot be provided over 12,000-foot FTTD.